Amendment to the Claims:

The following listing of claims replaces all previous versions and listings of claims:

1. (Currently amended) A method of reading a set of data stored in a memory device, the method comprising:

causing a first optical beam to interfere with a second optical beam at a prescribed angle therebetween at a first selected hologram appearing in a selected layer of a plurality of layers in the memory device, the first selected hologram containing at least a segment of the set of data and having a discrete location and a corresponding address in the memory device, generating thereby an N^{th} diffraction order wavefront;

wherein the first and second optical beams are characterized by a wavelength, an optical path length and a state of polarization;

sensing the N^{th} diffraction order wavefront diffracted from the hologram;

correlating the N^{th} diffraction order wavefront with a correlation pattern which includes the set of data; where N is an integer;

if a correlation peak occurs, deconvolving the N^{th} diffraction order wavefront and the correlation pattern; and

reading the set of data corresponding to the selected hologram and contained in the deconvolved N^{th} diffraction order wavefront.

2. (Original) The method as set forth in Claim 1 wherein the first optical beam and the second optical beam emanate from an extended light source or a light source with a broad spectral composition.

3. (Currently amended) The method as set forth in Claim 1 wherein the first optical beam has a first wavelength, $\lambda 1$~~-$\lambda 2$~~, and the second optical beam has a second wavelength, $\lambda 2$~~$\lambda 2$,~~.

4. (Original) The method as set forth in Claim 1 further comprising reading the set of data corresponding to a second selected hologram and in the N^{th} diffraction order wavefront by changing the optical path length of one optical beam with respect to the other.

5. (Currently amended) A method of reading a set of data stored in a memory device, the method comprising:

causing a first optical beam to interfere with a second optical beam at a prescribed angle therebetween at a first selected hologram containing at least a segment of the set of data and having a discrete location and a corresponding address in the memory device, generating thereby an N^{th} diffraction order wavefront;

wherein the first and second optical beams are characterized by a wavelength, an optical path length and a state of polarization;

sensing the N^{th} diffraction order wavefront diffracted from the hologram;

correlating the N^{th} diffraction order wavefront with a correlation pattern which includes the set of data; where N is an integer;

if a correlation peak occurs, deconvolving the N^{th} diffraction order wavefront and the correlation pattern;

reading the set of data corresponding to the selected hologram and contained in the deconvolved N^{th} diffraction order wavefront; and,

~~The method as set forth in Claim 1 further comprising~~ reading the set of data in the N^{th} diffraction order wavefront for a second selected hologram by changing the wavelength of one optical beam with respect to the other.

6. (Currently amended) A method of reading a set of data stored in a memory device, the method comprising:

causing a first optical beam to interfere with a second optical beam at a prescribed angle therebetween at a first selected hologram containing at least a segment of the set of data and having a discrete location and a corresponding address in the memory device, generating thereby an N^{th} diffraction order wavefront;

wherein the first and second optical beams are characterized by a wavelength, an optical path length and a state of polarization;

sensing the N^{th} diffraction order wavefront diffracted from the hologram;

correlating the N^{th} diffraction order wavefront with a correlation pattern which includes the set of data; where N is an integer;

if a correlation peak occurs, deconvolving the N^{th} diffraction order wavefront and the correlation pattern;

reading the set of data corresponding to the selected hologram and contained in the deconvolved N^{th} diffraction order wavefront; and,

~~The method as set forth in Claim 1 further comprising~~ reading the set of data in the N^{th} diffraction order wavefront for a second selected hologram by changing the state of polarization of one optical beam with respect to the other.

7. (Currently amended) A method of reading a set of data stored in a memory device, the method comprising:

causing a first optical beam to interfere with a second optical beam at a prescribed angle therebetween at a selected hologram having a discrete location and corresponding address in a selected layer of a plurality of layers in the memory device ~~device~~, generating thereby a interference pattern;

wherein the first and second optical beams are characterized by a wavelength, an optical path length and a state of polarization;

sensing an N^{th} diffraction order wavefront diffracted from the hologram; where N is an integer;

wherein the N^{th} diffraction order wavefront includes a correlation peak signal and the holographically stored data;

correlating the holographically stored data and the correlation peak signal in the N^{th} diffraction order wavefront;

if a correlation peak occurs, deconvolving the holographically stored data and the correlation peak signal; and

reading the set of data in the deconvolved N^{th} diffraction order wavefront.

8. (Original) The method as set forth in Claim 7 wherein the first optical beam and the second optical beam emanate from an extended light source or a light source with a broad spectral composition.

9. (Original) The method as set forth in Claim 7 wherein the first optical beam has a first wavelength, $\lambda 1$, and the second optical beam has a second wavelength, $\lambda 2$.

10. (Original) The method as set forth in Claim 7 further comprising reading the set of data in the N^{th} diffraction order wavefront for a second selected hologram by changing the optical path length of one optical beam with respect to the other.

11. (Currently amended) A method of reading a set of data stored in a memory device, the method comprising:

causing a first optical beam to interfere with a second optical beam at a prescribed angle therebetween at a hologram having a discrete location and corresponding address in the memory device generating thereby a interference pattern;

wherein the first and second optical beams are characterized by a wavelength, an optical path length and a state of polarization;

sensing an N^{th} diffraction order wavefront diffracted from the hologram; where N is an integer;

wherein the N^{th} diffraction order wavefront includes a correlation peak signal and the holographically stored data;

correlating the holographically stored data and the correlation peak signal in the N^{th} diffraction order wavefront;

if a correlation peak occurs, deconvolving the holographically stored data and the correlation peak signal;

reading the set of data in the deconvolved N^{th} diffraction order wavefront; and,

The method as set forth in ~~Claim 7~~ further ~~comprising~~ reading the set of data in the N^{th} diffraction order wavefront for a second selected hologram by changing the wavelength of one optical beam with respect to the other.

12. (Currently amended) A method of reading a set of data stored in a memory device, the method comprising:

causing a first optical beam to interfere with a second optical beam at a prescribed angle therebetween at a hologram having a discrete location and corresponding address in the memory device generating thereby a interference pattern;

wherein the first and second optical beams are characterized by a wavelength, an optical path length and a state of polarization;

sensing an N^{th} diffraction order wavefront diffracted from the hologram; where N is an integer;

wherein the N^{th} diffraction order wavefront includes a correlation peak signal and the holographically stored data;

correlating the holographically stored data and the correlation peak signal in the N^{th} diffraction order wavefront;

if a correlation peak occurs, deconvolving the holographically stored data and the correlation peak signal;

reading the set of data in the deconvolved N^{th} diffraction order wavefront; and, The method as set forth in Claim 7 further comprising reading the set of data in the N^{th} diffraction order wavefront for a second selected hologram by changing the state of polarization of one optical beam with respect to the other.

13. (Original) A data storage memory device comprising:

a plurality of recording media containing a set of holographically recorded data at discrete memory locations therein wherein each memory location is identified by a corresponding memory address;

means for creating an interference pattern between two beams of light at a selected one of the discrete memory locations in the recording media, generating thereby an N^{th} diffraction order wavefront;

means for sensing the N^{th} diffraction order wavefront emanating from the selected discrete memory location; and

means for reading the holographically stored data from the N^{th} diffraction order wavefront.

14. (Original) The data storage memory device as set forth in Claim 13 further comprising a plurality of memory address access media alternately interleaved between the plurality of recording media for allowing access to the data recorded at the discrete memory locations.

15. (Currently amended) A data storage memory device comprising:

a plurality of recording media containing a set of holographically recorded data at discrete memory locations therein wherein each memory location is identified by a corresponding memory address;

means for creating an interference pattern between two beams of light at a selected one of the discrete memory locations in the recording media, generating thereby an N^{th} diffraction order wavefront;

means for sensing the N^{th} diffraction order wavefront emanating from the selected discrete memory location;

means for reading the holographically stored data from the N^{th} diffraction order wavefront; The ~~data storage memory device as set forth in Claim 13~~

wherein the plurality of recording media comprise layered holograms and wherein the interference pattern exists over a dimension less than a thickness of the recording media along the direction of travel of the beams of light.

16. (Original) The data storage memory device as set forth in Claim 13 wherein means for creating an interference pattern between two beams of light comprises an extended light source or a light source with a broad spectral composition.

17. (Original) The data storage memory device as set forth in Claim 13 wherein means for creating an interference pattern between two beams of light comprises a coherent source of light.

18. (Original) The data storage memory device as set forth in Claim 17 wherein the two beams of light comprise a first beam of light having a first wavelength, $\lambda 1$, and a second beam of light having a second wavelength $\lambda 2$.

19. (Currently amended) The data storage memory device as set forth in Claim 17 wherein the two beams of light are crossed polarized with respect to one another <u>and the means for creating an interference pattern comprises rotating at least one of the beams of light</u>.

20. (Original) The data storage memory device as set forth in Claim 17 further comprising means for changing the wavelength of the first beam of light or the second beam of light.

21. (Original) The data storage memory device as set forth in Claim 19 wherein the plurality of memory address access media comprise media which cause a change in phase of the two beams of light with respect to one another generating thereby non-cross polarized beams of light.

22. (Original) The data storage memory device as set forth in Claim 13 wherein means for reading the holographically stored data from the Nth diffraction order wavefront is in communication with a distributed computer network, the network including network devices configured to execute program software allowing the devices to send, receive, record, store or process original, compressed and decompressed holograms or sets of data between and amongst themselves via the network.